THE VETERINARY RECORD

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Edited by WILLIAM HUNTING, F.R.C.V.S.

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THE NATIONAL VETERINARY ASSOCIATION.

The arrangements for the annual meeting of this Association are now almost complete. The meeting will be held in London on July 29th and 30th at the rooms of the Society of Arts, commencing at 10 a.m. on the first day.

The major subjects for consideration are Glanders, Pneumonia in the Horse, and Distemper in Dogs. No more important subjects could have been selected and the discussions are expected to be lively and instructive.

The usual exhibition of surgical instruments and therapeutic agents will be added, and we would suggest that exhibitors should at once secure the required space for their displays.

The annual dinner will take place on the evening of the first day at the Holborn Restaurant and a new departure will be made in admitting ladies to the function. This means that the toast list will be curtailed and the musical entertainment made a special feature. Judging from the greater *éclat* which has been given to the last five annual meetings by the attendance of ladies it is a safe conclusion to say that the dinner this year will be an event to be remembered.

Meetings of the Association in London have not hitherto been so successful as those in the provinces. This year the capital has awakened to the fact that it has hardly done justice to itself or the largest veterinary society in the kingdom. The practitioners of the metropolis and the surrounding districts have formed an Entertainment Committee, with Professor Macqueen as chairman, and they propose to follow the example set by Edinburgh, Dublin, Plymouth, Reading and Yarmouth.

We believe the entertainment will take the form of a trip up the Thames with lunch at one of the celebrated riverside resorts. This will follow the meeting, and fill up Thursday, July the 31st. It is intended to so arrange the affair that the guests will be landed at Paddington station by seven or eight in the evening, in time to catch trains for the country.

Every member of the Association will receive an invitation for himself and a lady but, as the arrangements depend upon the numbers accepting, it is hoped that all intending visitors will notify their intentions as promptly as possible after receiving an invitation.

Our advice to members is to make their arrangements at once so as to cover the three days over which the meeting and river trip extend. Remember the dates—July 29th, 30th, and 31st.

FISTULOUS WITHERS.

Bay cross-bred horse, 14·2, entered for treatment 28th May, 1897.

History.—For ten days a swelling in the near side of the withers which broke without surgical interference and discharged a great quantity of pus. On examination there was found on the near side of the withers an ulcerated opening 5 cm. in diameter, the probe penetrated some centimetres towards the neck and in a horizontal direction backwards. Comparing the two sides of the withers the left near was somewhat swollen. There was also extensive œdema in the region of the sternum.

On 1st June it was operated on, the region was disinfected and a vertical incision was made 12 cm. long above and below the opening; the edges were dried and the margins held apart by hooks; all the degenerate tissue of a lardaceous nature was removed; from this opening it was found impossible to remove other tissue traversed by numerous fistulæ towards the neck, so at a distance of 10 cm. from the incision another, vertical and parallel, 8 cm. long, was made from which a separate and distinct mass of tissue was removed and the two hollows briskly scraped. Three drainage tubes were inserted, one horizontal on top, two vertical in the incisions, then under a continuous stream of warm sterilized water the two incisions were sutured. During the operation there was but slight hæmorrhage, easily controlled by tampons. Once daily the parts were irrigated with sublimate solution 1-1000. The abundant suppuration diminished considerably after the first day. On the 7th day the drainage tubes were removed, on the 12th the sutures, and on the 20th a blister was applied. On the 24th the horse was discharged, and remained cured.

Bay cross-bred horse, 14·3, 6 years, entered for treatment 15th March, 1898. The owner stated that a fortnight before the horse had shown without any apparent cause a swelling on the withers about as big as an orange. A veterinary surgeon was called in and made two vertical incisions from which escaped a considerable quantity of sanguineous pus. In spite of the treatment, the discharge did not stop and the swelling reappeared, hence the reason for the horse's coming to hospital.

At the time of examination there was a swelling on both sides of the withers as large as a melon, of a spongy consistency; the skin was thickened, and adherent to the subjacent tissues; on the near side were two ulcerous apertures 3 cm. long, 2 cm. wide, corresponding to the incisions previously made. The probe showed the existence of several cross fistulæ,

one of which went down some 7 to 8 c.m., others upwards towards the spinous apophyses of the vertebræ. The horse was operated on on the 16th, being thrown on the off side. The usual antiseptic measures were observed, and on the near side an incision 15 cm. was made in continuation of one of the former incisions, so that a large amount of degenerate tissue was removed from the various fistulæ. The supraspinous ligament of the vertebræ was reached before all was removed, and an incision was made on the off side to allow of the removal of large pieces of the trapezius and dorsal muscles. The hole was scraped at the bottom and drainage tubes inserted like an U over the withers coming out on either side so that the whole of the cavity could be irrigated with 1-1000 sublimate solution. The incisions were sutured. In the course of treatment these facts were salient, viz., suppuration was extraordinarily abundant, so that for the first four days the wounds were irrigated several times a day. The temperature rose. On the third day there was a swelling outside the near elbow which extended downwards, but yielded slowly to massage and cold water. But on 22nd, six days after the operation this swelling was found to contain pus. The horse was again thrown, and a long drainage tube inserted at the lower third of the arm after having scraped the parts. Next day, temperature was normal, and in a few days the suppuration was visibly diminishing. On 28th March the tubes and sutures were removed; on the near side the sutures which had cut out were dressed with calomel and iodoform. April 11th a blister was applied. April 30th the animal was discharged and has remained well since.—*La Clin. Vét.*

In 1892-3 the translator frequently saw Dr. W. F. Widden, M.R.C.V.S., perform similar operations with like success under similar conditions, but not having records of the cases quotes these as examples.

F. E P.

Death from Chloroform in Horses.

During the academical year of 1898-99 at the Berlin Veterinary School, Frohner operated on 142 horses under chloroform without an accident. Out of 800 cases he records one death from chloroform intoxication, one from asphyxia, and two from pneumonia. He also records cases of vomiting and paralysis of the vocal cords.—*Traité de Therapeutique Chirurgicale des animaux domestiques.*—P. J. Cadiòt and J. Almy, p. 41.

Joshua A. Nunn, Vet.-Lt.-Col.

VETERINARY SOCIETIES.

THE VETERINARY MEDICAL ASSOCIATION OF IRELAND.

A general meeting took place at the Gresham Hotel, Dublin, on Wednesday, May 28th. Mr. Charles Allen, President, in the chair. Also present: Messrs. J. V. Daly, W. Chambers, C. Jones, F. Lindsay, W. H. Wilkinson, A. E. Mettam, M. Hedley, J. D. Richardson, F. Kerr, A. J. Beckett, R. B. Freeman, Vet.-Col. C. Steel, W. Cargill-Patrick, J. J. Kelly, and J. McKenny. Visitors: Messrs. J. A. Jordan and W. P. Cushnahan.

Mr. J. V. Daly, who had given notice of a motion *re* suggesting to the National Hunt Committee the necessity of appointing a Veterinary Surgeon to attend each of the race meetings, and that an ambulance waggon should be in readiness to remove an animal from the course in the event of an accident, said: I bring this matter forward as I consider it for many reasons desirable that the suggestions be carried out, and having been connected with racing for years many cases have come under my observation pointing to the advisability of having a V.S. in attendance with the necessary appliances.

Within the last few years up-to-date race meetings have a medical man in attendance; he has his own room in the enclosure, stocked with the necessary medicines, surgical appliances, and a stretcher. I have seen the great benefit it has been to unfortunate jockeys who have met with an accident.

To all who are fond of the horse—and who is not, it is a painful sight to see one that has met with an accident lying on the course surrounded by a crowd, no doubt sympathetic, offering all sorts of suggestions not only as to what is the matter, but as to how it should be treated.

The V.S. can do very little, but it is quite probable in many cases if a proper ambulance waggon was on the spot that the horse being put in it and taken up to the stable where slings could be used good results would follow. At present if a horse gets badly staked or receives a wound the owner or trainer goes running to find a V.S. and when he has found him what happens? The V.S. has to use his own pocket handkerchief and anyone else's he can get to plug or bind the wound as the case may be, or collect pins to secure it. The I.N.H. or the Turf Club do not appoint medical men, nor is there anything in the rules about the matter; it is the executive of the race meeting that makes the appointment. But I consider we should go to the former bodies and lay our views before them. I am sure if they consider it possible they will meet our wishes. Most of the members of these bodies are owners of valuable racehorses, all of them are sportsmen. They have the granting of a licence to the race meeting and can therefore enforce their wishes. The only difficulty I see in the matter is that of small country meetings. These could not of course be expected to go to the expense of an ambulance waggon. This I think could be met by the authorities keeping a few waggons and lending them to small meetings. A small sum could be charged to keep them in repair, etc., and I am sure the R.V.C. of Ireland would look after them. I am sure the railways all having benevolent gentlemen as directors would carry the waggon to and from the meeting free. I only know of one race meeting at present that has its own V.S. in attendance—our worthy President, whose name figures on the race card. I couple the Turf Club with the I.N.H., as accidents occur under both branches of sport. If there had been an ambulance waggon at Epsom Holocaust could have been removed from the public gaze until it was decided whether to treat or destroy him. I hear at the recent Baldoyle meeting Aderno broke his back on the flat.

Now we must look on this matter as sportsmen as well as veterinary surgeons, and I think we ought to approach the subject quietly; as if some outsiders heard it they would imagine that when we thought it necessary to move in the matter that a race meeting must be something like a Spanish bull fight. I would suggest that the matter, if it is considered necessary to go on with the suggestion, be referred to the Council to consider, and I would also strongly advise that Mr. Peard, as a member of our profession and a manager of two important race meetings, and who is intimately connected with racing, be asked to assist us with his advice. The V.S. should be a local man.

Mr. HEDLEY said the suggested action would be both in the interests of owners, and for the welfare of the animals concerned. Racehorses very frequently sustained injuries in the course of their engagements such as did not admit of the animal being walked from the scene of the disaster, and as it became necessary to immediately treat or destroy the patient, it is obvious that to avoid unnecessary suffering a means of conveyance for treatment, or a veterinarian to advise as to destruction, is both humane and expeditious. He had very much pleasure in proposing that the matter should be referred to the Council, and that the Council be requested to draft a suitable communication to the bodies who would have to deal with the matter.

Mr. MCKENNY seconded the proposal, which was carried.

PRESIDENTIAL ADDRESS.

Mr. C. ALLEN, F.R.C.V.S.

Gentlemen,—The means of locomotion a quarter of a century ago—both for man and animals—were not so adapted for securing rapid and convenient transit as they are at the present period, and at that time it was the custom for the breeders of horses to bring their stock to local fairs, whence they generally found their way to Dublin. There were several "Repositories" in the Metropolis, among which he named Dycer's (Stephen's Green), Sewell's (Mount Street), Brown's Bazaar (Stephen's Green), Anderson's (Mary Street), and Cashman's (Pembroke Street)—the greatest perhaps being Farrell's (Brunswick Street), standing on the present site of Tara Street. Daily sales and auctions took place at these, and the veterinary surgeons were actively engaged. Among those best known in their profession at that time were Professor Ferguson, Messrs. Farrell, Paley, Doyle, Murphy, and Reynolds.

Animal diseases of various kinds prevailed in Dublin, notably Glanders, Rabies, several ailments generally classed as "Distemper," and Pleuro-pneumonia. The last mentioned was very prevalent and no satisfactory method existed of dealing with it, the consequence of which was that the infection spread not only through the city herds but all over the country. The better class cows were fattened and sold to the butcher: the others were surrendered to the authorities. No precautionary measures were adopted, and no cleansing and disinfection carried out. Now, however, owing to proper and scientific methods having been adopted to eradicate the disease it had completely disappeared from this country.

With reference to the question of the examination of horses as to their soundness in connection with sales, the President explained the unsatisfactory arrangement which formerly existed by which the fee was paid by the seller if the animal proved to be unsound, by the buyer if sound. This led to much unpleasantness, and he determined to take steps—which he detailed—to put an end to the practice. In this, as his suggestions met with the approval of most of the other practitioners, he was entirely successful.

A great deal of jealousy and ill-feeling formerly existed among the veterinary surgeons, which he considered was attributable to their not having an Association such as this where they might meet in friendly intercourse and exchange professional experiences. He thought an effort should be made to bring about a better understanding between his fellow practitioners, and issued invitations to them to meet at dinner at his residence. All, practically, accepted, and after a pleasant evening the details of the Association at present in existence were discussed and a scheme drawn up for its foundation. Col. Chas. Steele was elected President, Major Kettle, Secretary, and he himself Treasurer. They held regular meetings at which many excellent papers were read and discussed—one in particular on the subject of "Roaring," by Col. Steele. This was especially interesting owing to the late George Fleming having at that time been describing an operation (said to be original, though performed by Gunther, as well as by their worthy friend Mr. McKenny for many years previously) to relieve it by removal of the arytenoid cartilage. After several meetings and discussions they came to the conclusion—since proved to be correct—that the only means of relieving respiration was by performing "Tracheotomy."

The veterinary surgeon of the present day was a man of education and culture, and had to serve a long apprenticeship and pass several trying examinations before securing the necessary diploma; consequently he is entitled to social status and respect. He urged on all the younger members of the Association in particular the necessity for keeping this in view, and upholding by their conduct, manner, and even dress, the dignity and importance of their profession. He mentioned several disabilities under which the veterinary surgeon labours, and the jealousy to which he was exposed; and this made it even more necessary that care and discretion should be exercised in all their undertakings.

In conclusion he referred to the newly established Royal Veterinary College of Ireland, an institution equipped to the very latest scientific requirements. At first he was inclined to oppose its establishment, as he did not consider the necessary means and facilities existed in Dublin for the suitable training of veterinary students; but now that it had been founded it was the duty of veterinary surgeons in practice to further its ends by every means in their power, and they should perhaps give the greatest assistance by sending interesting cases for the free Clinique.

He returned them his sincere thanks for the honour they had conferred on him by electing him to the office of President, and hoped that the coming year might be one of good fellowship, profit, and scientific advancement for the members of the Veterinary Medical Association of Ireland.

SPECIMENS.

Mr. ALLEN brought under the notice of the meeting a specimen of a fractured bone of a horse's hock which had hunted for several seasons with the Ward Union Hunt, and had not shown any appearance of lameness. On the occasion of one hunt, it was going as well as usual until about half a mile from home when it went a bit sore; the next day it suddenly got very bad, and he was telegraphed for. On arrival, he found the horse down and unable to rise, lying on the sound side; and from the appearance of the animal it looked like a fracture of the pelvis. He found very little swelling; finally came to the conclusion that there was fracture and injury to the bones of the hock, and ordered the animal to be destroyed. On making the post-mortem examination he found the bones as shown (specimen exhibited). This had been a sound horse before, and never known to give a lame step; there had been no sign of disease about him. The horse was about 8 years old, and lived for three days after going lame. The huntsman was very much astonished when he heard what was the cause of the lameness.

Mr. BECKETT exhibited a specimen of fractured radius, chiefly remarkable for the simple way in which it occurred. The animal, a van mare of 12 or 14 years, was passing a stall on her near side, the stall being occupied by a waggon gelding. While the mare was walking past with her near leg extended in motion the gelding struck out at her with one foot. His foot passed under her chest and struck the inside of the off fore arm, on which her weight was at that moment. The driver states the mare went down as if shot and lay struggling, utterly unable to rise. On arrival about half an hour after the accident the mare was found lying wedged between the door post and stall. Violent struggling followed any

attempt at manipulation. There was a peculiar pulpy feel about the site of the lesion, but no crepitus. This was evidently due to the marked displacement of the fragments of the radial shaft. Immediate slaughter was advised and carried out. The specimen shown was a good example of a comminuted fracture, and proved how a severe injury might result from what was apparently an altogether insufficient degree of violence—if the history given of the case by the driver is exact.

Mr. BECKETT also showed two X rays photographs. The first displayed a fracture of the femur in a puppy three months old, which occurred from the animal running against something, at least that was the history he got. It was brought to Mr. Freeman about four days after the occurrence. There was no crepitus, and he determined to get an X ray photograph of the injured llmb. He thought it interesting, the ends of the bone were overriding, and the injured leg was considerably shorter than the other. There was no difficulty in diagnosing the fracture, although there was no crepitus.

The second photograph was that of an injury to a dog six months old, a fracture at the end of the humerus. The dog caught in a gate and was wrenching to get out, the bone was broken across.

In the first case he chloroformed the puppy, and it got a three minutes exposure; in the latter they simply held the dog, and exposed for 1½ minutes. The first was a far better photograph. The photos were taken by Mr. Lewis, of Capel Street.

A specimen of an inverted cæcum was also exhibited. It was a case of chronic intermittent colic, and had lasted for three weeks nearly. Mr. Freeman suspected strongylus, and treated the case, and they got a few worms (strong. tetracanthus). In the end it collapsed, and they found the cæcum totally inverted, and filled with a jelly-like pulpy mass, as seen in the specimen.

Mr. HEDLEY suggested that specimens brought for exhibition at their meetings might for greater convenience, and for the purpose of closer examination, be brought without the spirit, or other preservative fluid.

The specimen which I bring under your notice is the fore foot of an old hunter which was afterwards worked as a carriage horse. Having been lame on several occasions from what was believed to be navicular disease the operation of neurotomy was performed. The owner was given to understand that there was a certain amount of risk in the after effects of the operation; that the animal would lose sensation, etc., therefore the responsibility of using him as a carriage horse was entirely thrown upon the owner.

During the horse's hunting career he had had several heavy falls. Although not showing any very marked change, yet it was evident that he had not recovered from them with the rapidity which many horses exhibit in recuperative power. These points at the time did not have sufficient weight given to them.

In the course of one rather bright summer afternoon the fire brigade of the town had been exercising the force, the engines, etc., and thrown a good deal of water on the streets in irregular patches. The horse was given to shying, and on this occasion he shied at a pool of water, threw out the leg as though to support himself, but fell heavily, coming sharply on to his nose, damaging his mouth, and he was unable to rise. The scene of the accident was not far removed from the veterinary establishment at which I was engaged, and with difficulty the animal was removed—being supported by men on either side—until he was brought into the yard and slung. He made little or no use of the lame leg. When standing in slings the shoulder was dropped, the toe turned backwards and upwards, the rest appeared to be on the os suffraginis. The symptoms presented during the time the animal was in slings indicated that he had sustained brain injuries as well as injuries to the foot. An examination was made and it was believed that the inferior maxilla was broken about the condyles; he was unable to open the mouth to chew, became very feverish, and as he was not a young horse the owner determined that the best thing to do, having regard to his several injuries and that he was not progressing favourably, was to slaughter him.

The post-mortem examination revealed the specimen which I now submit, showing that the navicular bone was fractured. As at that time I was studying the brain I determined to remove the brain from the skull, and commenced operations, but found on examination that the condyles were intact, and that the basilar process of the occiput was broken. The brain was removed and put into spirit to harden. When making sections of the brain I found a tumour in each of the ventricles.

The post-mortem examination assists in determining the peculiarities which were noticed during the animal's life. The difficulty to recuperate was probably due to the hæmorrhage into the ventricles, which eventually produced the tumour. It seems to be coincidental that the climax should have arrived in such a peculiar manner as fracture of both the navicular bone and the basilar process of the occiput. It is rare that such a multiplicity of conditions exist in one subject. I regret that I am not able to submit the tumour, although great care was taken of it for a considerable period. Eventually, however, in my absence from home it was destroyed in the belief that it was of no use, and the process referred to was sent away with a number of other old specimens which were of more value to myself than anyone else. The specimen now brought under notice was only saved because it had been carefully dissected and hung up and subsequently varnished, the latter operation against my wish, as I considered it to a certain extent lessened the value of the specimen.

The horse had never shown any brain symptoms before this accident, except the shying referred to. Might this be due to pressure on the optic nerve produced by the tumours? It was a very high-stepping horse, he would hardly have expected to see an ordinary horse step so high.

Mr. ALLEN said it was a mistake to suppose that because a horse stepped high it was not fast. One of the highest steppers he ever saw was a racer named "Victor Wild," a successful racer too, and he went high in his gallop as well.

FRACTURE OF FIRST RIB.

By JAMES MCKENNY, M.R.C.V.S., Dublin.

The opinion that it is impossible for only one of the first ribs to be fractured unaccompanied with fracture of some of the surrounding structures is, in a sense, not an unreasonable one, seeing that it may be argued that the latter protects the former from all external injuries, and the costal muscular power is quite inadequate to cause fracture. Owing to the manner in which the first ribs are protected, their attachments, and the office they fulfil, any violence capable of fracturing one of the first ribs must necessarily cause fracture of some of the rigid structures surrounding it, superiorly the vertebræ, inferiorly and partly anteriorly the sternum, posteriorly the other ribs, and externally the scapula. This line of theorising is not merely hypothetical; it has, indeed, a basis of mechanical anatomical facts, and therefore is worthy of respect. However solid such a basis may be, if the conclusions are in fact erroneous, then it behoves us to plead ignorance or explain the phenomena. I do not purpose at present entering further on this point.

The symptoms of fractured first rib have been described by some as follows:—Elbow dropped, knee protruding and flexed, fetlock knuckled, and toe of foot only on ground. These symptoms others hold to be common to other injuries, such as laceration of the triceps muscles, fractured scapula, pisiform bone, or navicular bone,

and I may say that during my thirty-five years' experience I have found somewhat similar symptoms exhibited in the above-named injuries. But, to my mind, there is no difficulty in differentiation, taking them in the above order. For instance, accompanying the foregoing described symptoms, the diagnostic symptoms may be said to be as follows :

In cases of injured triceps we get local heat, swelling, and pain of the parts without crepitus, whereas when the scapula is fractured, on moving the leg backwards and forwards, and inwards and outwards, we get a distinct crepitus easily localised, and when we get a crepitus on abduction and adduction of the fore leg on the affected side, which cannot be localised, and cannot be obtained on bringing the leg backwards and forwards, the first rib is broken.

Again, when the pisiform is injured the swelling at back of knee at once attracts attention, and manipulation readily decides the injury ; and when the navicular is broken, usually the history of the case, alteration of the outer structure of the foot, heat of same, and pain on being forcibly brought forward, decides at least the locality of the injury. It might be said that in the absence of any of the foregoing diagnostic symptoms it would be reasonable to conclude that the first rib was broken, and I concur with the opinion ; but for many years past I have been able to still further satisfy myself by obtaining the essential corroborative evidence of crepitus, and it is specially to this that I now draw attention, viz., the crepitus of a fractured first rib can be obtained only by crossing the fore-leg near the affected rib as far as possible across the front of the sternum, and then jerking it outwards (adduction and abduction) ; the crepitus thus obtained will be readily felt when the hand during the process is kept firmly on the scapula, but at the same time the crepitus, although distinct, will be dull, and, of course, cannot be localised to any part of the scapula. It also will be absent when the leg is moved backwards and forwards.

In support of the above statements I relate the following cases, which came under my observation :

Case 1. *Rupture of Triceps Muscles.*—A bay gelding five years old fell when being ridden with hounds at a drop fence, and immediately on rising was found extremely lame, could not bring the leg forward, or place its weight on it. Elbow dropped, etc. (to avoid repetition the etc. refers to knee bent forward, fetlock knuckled over, and toe only on ground). This case was sent in a float to my infirmary with a letter stating that a veterinary surgeon had examined the animal a short time after the accident, and gave as his opinion that a bone was broken, and advised that the horse be sent to the kennels for the dogs. I could not detect any crepitus, but on bringing the limb forward the animal evinced much pain, and when the limb was fully extended in this position and then jerked upwards, the pain became so violent that the horse reared and stood on his hind legs. Upon pressure being applied to the triceps pain was produced, and the parts being swollen, I diagnosed from the foregoing that the triceps muscles were ruptured. I had the animal placed in slings, and the leg supported in a manner which I will describe further on. The case apparently was doing well for five days, at the lapse of which time the patient had a severe attack of colic, and I deemed it prudent to let it out of the slings, whereupon it threw itself down and became most violent, and the owner seeing it in this state ordered it to be shot. The *post mortem* revealed a fresh clot of blood immediately above the olecranon process of ulna, extending upwards to the middle of the caput parvum, which was in this situation lacerated, The caput magnum and medium were also extensively lacerated, and between the laceration of the latter there was a dark sanguineous, glutinous fluid. There was no trace of a fracture, either of a bone, of a limb, or of the thorax. From the foregoing I concluded that the latter two muscles were torn on the occasion of the fall, and the other muscle was lacerated during the animal's struggles while suffering from the abdominal pain.

Case 2. *Lacerated Triceps Muscles and Fractured Lumbar Vertebræ.*—A four-year-old filly, while being lunged over a narrow, deep dyke with a small bank on each side, jumped short, and the hind legs consequently scraped down the bank, and the animal remained for some short time with the fore legs on the bank ; then, in attempting to get on or over it, the hind legs seemed to give way, and she fell into the ditch on her back, and had to be pulled out with ropes. I was then sent for ; the foregoing was the information given to me. I found her standing in the field beside the ditch, exhibiting dropped elbow, etc., symptoms ; but owing to the manner in which her hind legs were placed, and not being able to make any attempt to move a single step, I examined her further, and found she could not move her hind legs—which were wide apart—that her tail was limp, and on it being raised the resisting power was absent, and on being pricked with a sharp pointed instrument she did not exhibit any pain (paralysis of the motor and sensory nerves of the parts). These symptoms led me to examine for fracture of the lumbar vertebræ, and on causing the hind extremities of the animal to rock from side to side, I distinctly felt the crepitus of fracture, and therefore had the animal destroyed. I found the triceps muscles extensively lacerated, no fracture of rib or any of the bones of the fore-limb ; however, the transverse processes of the second and third lumbar vertebræ were broken into the body of the bones extending into the spinal canal, and the psoæ muscles were slightly lacerated.

Case 3. *Fractured Pisiform.*—Four year-old black race gelding, when being lunged over stiff timber, baulked, and on receiving a sharp cut of a long thonged whip jumped high and short, and came down with the back of its knees striking the timber. The animal was, with difficulty, taken into the stable, a distance only of a few hundred yards, and I was sent for, but did not see the horse until next morning.

The horse was standing with the near elbow dropped etc., the same knee was much swollen, and the pisiform bone, instead of being a backward projecting prominence, lay flat on the back of the knee. On moving it (which was difficult) a distinct crepitus could be felt. Hot fomentations and the application of cooling lotions, with perfect rest and a dose of physic, were prescribed, and in ten days the animal stood straight on the leg, and could walk sound ; but it never afterwards could be trained to race, as violent exercise always caused the knee to swell, and the horse then went lame.

Case 4. *Fractured Navicular.* — A steeplechaser seven years old had been lame for many months on both fore-legs, and had been kept going by the use of alternate hot fomentations and cold swabs applied from the knees downwards : however, in a race, when apparently going well, his rider said the horse stumbled several times and nearly came down, and so he at once pulled him up and got off, fearing the horse would fall. The horse was able to stumble off the course, and the owner and myself, seeing from the stand that the horse was seriously injured, walked over to it, and the dropped elbow symptoms were very apparent on the near fore-leg. However, from my previous knowledge of the horse I suspected the already diseased navicular bone had given way, and, on examination, I advised the owner to have the horse destroyed ; but he informed me the horse had previously been every bit as bad, and that after a few hours' fomenting he would be able to walk home, and would be fit to race in a short time. To this I replied " I would be much obliged if you would send me both of the horse's fore feet when he dies."

Three days afterwards I received a letter from the

owner stating that he had sent the horse to the knacker's and had instructed him not to destroy the carcase until I made a post-mortem examination. I found the navicular bone of the near fore foot fractured on its inner third, and the flexor tendon, where it passes over the bone, was slightly lacerated. The off fore navicular bone, os pedis, and flexor tendon were firmly united together with white fibrous tissue. Neither of the first ribs, nor the other bones of the fore legs, were fractured, that is with the exception of the navicular of the near foot.

Many similar cases I could enumerate, which, in my mind, establish the fact that when we see a horse with the elbow dropped, knee bent forward, fetlock knuckled over, and standing on front of toe, with inability to place the weight of the body on it, we should only look on these symptoms as common to a number of injuries, and not diagnostic of any particular injury. At the same time I admit that in the foregoing cases the enumerated symptoms were not all fully developed as in the case of fractured first rib, when they are all very definitely exhibited.

I shall now relate a few cases of fractured first rib, with post-mortem examinations, which came under my observation.

Case 1a. *Fracture of First Rib*.—Grey gelding, six years old, a hunter. I received a telegram to attend, at once, at a distance of ten miles, a horse seriously injured in the hunting field. On my way there I met a fellow practitioner, who told me that my client had informed him that he had wired for me, but that as the horse was in great pain he would be much obliged if he would have a look at the animal, and advise as to treatment until I arrived. My colleague examined the horse, and told the owner that the shoulder blade was broken, recommending that the animal be put out of pain at once; but as I was going, not to do so until I arrived. He added to me that he had not localised properly the exact position of the fracture, but that he distinctly felt the crepitus, and felt confident that it was the neck of the scapula, or it might be the upper end of the humerus; under either circumstances he was sure I would agree with him that the horse should be destroyed, and asked me to furnish him with the further particulars of the case. I found the horse in great pain, and exhibiting to a marked extent on the near side dropped elbow, etc., symptoms; and on adduction and abduction of the leg, a decided crepitus could be felt, but to obtain it the limb required to be moved as far as possible each way with a quick, decided movement.

However, failing to localise the fracture of the bones my friend had named, and as the crepitus was dull, though distinct, and not being able to obtain it by any other movement of the leg, my past experience of these symptoms led me to definitely form the opinion that the first rib was broken. The owner had left a note for me with the groom, instructing me to have the horse immediately destroyed if I agreed with the professional opinion already given; but, under any circumstances, I was to give the groom a note which he would at once convey to him. This put me in a dilemma, as I had a decided objection to *point blank* disagree with the opinion already given, and yet I would not stultify myself in the matter; therefore I wrote stating I agreed with my colleague as to the fact that the horse was suffering from a fractured bone, but that as the animal was a valuable one I requested that it be submitted to treatment. I requested that if the owner wished to act on my recommendation he should wire me, and I would at once attend and bring the necessary appliance; but that if he had the horse destroyed I would feel obliged if he sent it to the knacker in the city, so that I might make a post-mortem, as the case was of much interest to me. Next morning I received a wire stating that the knacker named had come and destroyed the horse and taken the carcase away, and had received orders not to dispose of it until I gave permission. My colleague and myself made a post-mortem, and found the first rib broken, but no other fracture or injury to account for the symptoms exhibited previous to death.

Case 2a. *Fracture of First Rib*.—Valuable hunter, cost £250, went brilliantly in a long hunt, and was being ridden home; but, to shorten the distance, was taken across a few fields and jumped over a small ditch on to a bank of collected road stuff covered with grass. The horse bungled on landing, and nearly came down on to the road. The rider at once got off, and expected to find the horse's heel cut, or something in the foot, but he did not discover anything to account for the mishap; so, previous to remounting, he thought it advisable to walk the horse for a short distance. However, to his astonishment, the poor beast when it attempted to walk, the moment the weight came on the off fore leg, nearly fell, and it was with great difficulty that he was got home on three legs. Two veterinarians, who were at the hunt, examined the horse, and said the shoulder was broken, and advised that the animal be at once destroyed. I was sent for, and as the horse exhibited similar symptoms to those of Case 1a, I pronounced it was suffering from fracture of the first rib, and advised treatment. In three months the horse was perfectly recovered, and 27 weeks from the date of the accident he was sold at a fair profit, being passed as sound by one of the two veterinarians who had seen him when suffering and had ordered him to be shot.

The treatment was as follows:—The animal was placed in a loose box, at the near side close to the wall, and at about a foot from the off side was fixed a strong pole, which, in front, was on a line with the point of the shoulder, and behind, a little below the stifle. A chain was attached from the head collar to the wall in front and above the head, and one on each side of it, but lower down. By this means the animal was prevented from lying down, or moving forwards, backwards, or sideways; at the same time the animal could be easily attended to, and was not smothered as it would be if placed in a narrow, high stall. The floor was covered deeply with peat moss, mixed with sawdust and sea-sand equal parts. Having thus attended to the animal's comfort and sanitation, I placed and retained the off fore leg in the most suitable position with the view of favouring union of the fractured rib and preventing atrophy of muscles. I wish to draw particular attention to a simple but effective arrangements, viz. a splint made of thick, strong leather, lined with thick felt projecting over the leather. This splint is shaped to fit the forearm, from the elbow to a little below the knee, and having suitable straps on either side, so that it can be properly adjusted and securely fastened to the forearm with the open side in front. Upon the centre of the external surface of the splint a ring is firmly and securely attached, and, when in use, the ring is found at the back of the forearm. It is further necessary to have a good, strong surcingle with a suitable ring secured to it, so that when in position upon the horse the ring will be underneath. When the splint and surcingle are fastened on to the horse, a strap is passed through the rings on the back of the splint and lower surface of the surcingle, and, on being drawn together, the elbow assumes its normal position, and on fastening the strap, the structures remain in the position. Parts are thus fixed, and those who see the effect for the first time, I have always found, express surprise at the immediate relief the animal seems to obtain. Sometimes it is necessary to place the fetlock in poroplastic splints or plaster bandages.

I could enumerate many other cases exhibiting similar symptoms, and which I diagnosed as suffering from fracture of the first rib, but they recovered under the treatment I have described.

I have selected cases in which a difference of profes-

sional opinion occurred, and, as in each case my diagnosis was confirmed by post-mortem, and, fearing this report will stamp me as an egotist, I will state another case.

CASE 3A. *Fractured First Rib.*—A high-class stepping harness horse came into collision with a van, and was thrown down. The owner came for me, and we at once drove to the scene of the accident—a rather crowded thoroughfare—and I scarcely need say a very large concourse of people had collected. On examining the animal I distinctly felt a crepitus when the leg was drawn outwards and inwards, and I said the bone was broken, believing the scapula was fractured, and advised that the horse be at once destroyed. This the owner agreed to, and the knacker very quickly was on the scene and ended the poor beast's sufferings.

I made a post-mortem, and to my chargin found the scapula perfect, but the first rib was broken. I may, under the circumstances, be excused for the error, especially when I state that it occurred many years ago, and the dropped elbow, etc., symptoms were not then closely studied by me. I hope, however, I understand them better now.

Before I conclude I shall submit one case more, although, owing to complications it is not a typical one, but it is of special interest, inasmuch as I brought it under the notice of several veterinarians, and gave them the opportunity of examining the horse, and although they did not positively disagree with me as to my diagnosis (fractured first rib) yet they expressed some doubt as to its correctness, and concluded by saying they would agree with me if, on post-mortem, the rib was fractured.

I promised them that should such an examination become available, I would send the horse to the Royal Veterinary College of Ireland so that an independent, unbiassed post-mortem examination would be made. Fortunately, or unfortunately, the horse died of "Septicæmia," and I had the carcase sent to the College as promised, and the Principal (Professor A. E. Mettam) made the post-mortem, and kindly consented to attach the result of the same to this report.

CASE 4A. *Fractured First Rib.*—A high class hunter, when being ridden with hounds, partly refused to jump a narrow, deep ditch with a raised bank on the landing side, the hedge on which had recently been closely cut down. The rider finding the horse unwilling to negotiate the obstacle, steadied it by crossing the bit in its mouth, and then bringing it straight at the ditch, but slowly. When the horse was within a few yards of it the rider held its head straight and fairly tight, and plunged the spurs into its sides, whereupon the horse plunged forward and made a poor attempt to jump the dyke and up the bank, with the result that its fore parts struck the bank and the animal fell on its back into the deep, narrow ditch. Strange to say, the same day five other horses also came down at various parts of this apparently not difficult jump. The horse in question had to be dragged out of the ditch, and it then was bleeding freely from an extensive wound situated below the head of humerus, between it and the sternum, and injuring the pectoral muscles. Seven large handkerchiefs were at once tightly plugged into the wound, and by this means the hæmorrhage was decidedly checked, but it was found that the horse could not place any weight on the off fore leg, and it was with difficulty that the animal was brought on three legs to a stable close at hand. A telegram was sent to me, and on my arrival I found the horse in much pain and exhibiting the dropped elbow, etc., symptoms, coat staring, shivering violently, and weak, evidently from loss of blood. I gave the horse a stimulant, removed the handkerchiefs from the wound, and had it washed well with tepid water, to which I added a little Jeyes' fluid; I afterwards dressed the wound with carbolic oil, and dusted iodoform over it. I purposely omitted until now to state that I distinctly felt a dull crepitus on adduction and abduction of the leg, but could not get any crepitus on moving the leg backwards and forwards; therefore, as from my experience I hold that the foregoing symptoms are diagnostic of fractured first rib, I unhesitatingly and definitely made the statement, but, owing to the wound, could not give a favourable prognosis; however, I advised that the animal be removed to my hospital in a float, and that I would do the best I could for it. Having arrived at my infirmary, I put the horse in slings, as it was very weak, and applied the splint already described. The horse apparently was going on satisfactorily, with the exception of having a high temperature, until the morning of the tenth day; on that morning it received a mash of bran mixed with a little boiled flax seed, and it at once began to eat, apparently with a good appetite. In a few minutes, however, a noise was heard in its box, and my assistant, who was about ten yards away, ran to see what was the cause, and was astonished to see the horse plunging and kicking in a most frantic manner; so violent were the struggles that it was highly dangerous to go near it. This state of matters lasted for about ten minutes, when the animal suddenly collapsed, and remained in a comatose condition for about fifteen minutes and died.

The following is Prof. Mettam's report of post mortem examination:

"Through the kindness of Mr. M'Kenny I had an opportunity of seeing his patient during life, and the privilege of a post-mortem examination at the College after its death. I had no difficulty in perceiving the crepitation sounds when the fore limb was adducted and carried across the mesial plane of the animal, and then abducted. That there was a fracture somewhere I had no doubt, but as to the exact site I was somewhat sceptical. However, the post-mortem examination revealed the following:

There was a large wound at the root of the neck and anterior to the thorax. It passed through the mastoido-humeralis and anterior deep pectoral muscles. There was no pus. The muscles injured were black, and the fascia in the axilla around the axillary vessels and brachial plexus was discoloured, in part due to extravasated blood, and in part due to post-mortem decomposition.

I removed the right fore limb to examine carefully the anterior ribs. The right first rib was found fractured at about the junction of the upper and middle third, at the place where the smooth area is provided on the rib for the brachial plexus. The upper end of the lower portion of the rib was internal to the lower end of the upper segment; the edges were smooth and rounded off as if there had been a good deal of movement between the two ends of the rib. The condition of the two ends disposes of any doubt as to whether the rib was fractured prior to death or after, and is exactly what is to be expected to occur when the two ends of a bone are in close proximity and cannot be retained in exact apposition. The outer edges of the opposed segments were rounded, the inner were still sharp. On preparing the specimen for the museum, the second rib of the right side was found to be fractured; this passed obliquely through the neck of the rib. There was little or no displacement. Here there was an attempt at repair, but such was not the case with the first rib. This discovery shows how necessary it is that a careful and detailed examination of other ribs than the first should also be made. Careful dissection down upon the fracture of the first rib showed that there was a small septic abscess; the pus was small in amount, chocolate coloured, and apparently consisted of pus and blood. I made films of this, and, of course, found it teeming with micro-organisms, chief among which were the bacillus of malignant œdema, streptococci, and staphylococci.

It was found that the fracture had caused a perforation of the pleura, and the superior part of the anterior lobe of the right lung was adherent to the chest wall. A

septic infection of the chest was found ; the fluid in the chest and the soft exudate upon the pleura had a strong septic odour. There was a septic broncho-pneumonia. The heart was flaccid ; the wall of the right ventricle was thinner than normal. The endocardium showed hæmoglobin staining, as did the lining of the large vessels leaving the heart. There were large patches of extravasation beneath the endocardium covering the papillary muscles. The walls of the pulmonary artery were thin.

As to the abdominal viscera, the stomach and intestines were normal, so also was the right kidney. The liver was in a condition of cloudy swelling, the left kidney had a cyst in it, the spleen showed numerous petechiæ beneath its peritoneal covering, and also an elongated depressed scar upon its surface. The aorta and its branches were normal, and so was the vena cava and its tributaries.

The ventricles of the brain contained relatively a large amount of fluid, dirty yellow in colour, and stinking horribly.

The cause of death was, of course, septicæmia.

The fracture, in my opinion, was produced by the object struck when the animal made the attempt to jump, the same object that produced the wound. After striking the rib the stake, or whatever it was, was deflected, and continued its course further under the scapula.

I think the dropping of the elbow is to be explained by an injury to the roots of the brachial plexus, from which the musculo-spiral nerve (or radial) is formed. These roots are the branches derived from the first and second dorsal nerves, and in view of the site of the fracture it is difficult to imagine how the nerves could escape injury. I cut sections of the musculo-spiral nerve, of a portion taken from the nerve where it disappears behind the humerus, giving off branches to the triceps and other muscles, but could not satisfy myself that there was any extensive degeneration such as one would associate with the train of symptoms observed."

Mr. McKENNY stated that since writing his paper on "Fracture of First Rib," he had had two cases that more or less bore on the points brought out in his paper. A horse was brought to him one evening ; the history of the case was this :—At the corner of Harcourt Street, a distance of a few hundred yards from his establishment, the animal was "shafted" in the lower portion of the neck ; it walked down his yard perfectly sound, but very weak. When he got within ten yards of the animal, he could hear the heart audibly, and from the propped position of the legs, etc., he saw that death was approaching ; the membranes were very pale, and he told the man he could do nothing for the horse. There was no wound outwardly visible, only a flap of skin, but on rising this an inch or so an opening was found in which you might easily put your hand, the skin forming a regular valve. The horse was bleeding profusely from the nose and mouth, and from the wound when the skin was raised ; it died in a few minutes. On making a post-mortem examination he found the second, third, and fourth ribs broken. Now the animal walked in sound, there were no dropped elbow lesions, and he thought that to a certain extent the case was of interest in connection with his paper.

The second case he would ask their attention to was that of a brood mare he was sent for to see some ten days previously. The owner could not say whether the animal was kicked or had fallen, or how the accident happened. The owner and those with him considered the shoulder was disclocated as there was a very large swelling. On going into the stable the animal had all the appearance of dopped elbow, and he (Mr. Kenny) considered it would be well to state the symptoms he noticed on that occasion. The animal instead of attempting to put any weight on the leg when asked to move, raised the fore part up, and did not put any weight on the limb. In "dropped elbow" as he understood it the animal will try to put weight on the leg and sink under it. In that particular case it did not attempt to do anything of the sort, but simply raised up the injured member and went on three legs. He had the shoulder fomented, and applied a cooling lotion (sugar of lead) and was very pleased to say the animal was now able to walk. If the symptom of dropped elbow was exclusively that of fracture of the first rib, certainly there was a case of it : but the symptom in his opinion was one common to a great number of cases, as was explained in his report.

Discussion.

Mr. HEDLEY remarked that it proved that the symptoms of "dropped elbow" did not essentially belong to fracture of the first rib. In the specimen he had brought under notice there was not only dropped elbow but there was curving up of the toe. That was similar to Mr. Mckenny's case, and it was that consideration that made him bring that particular specimen there that evening.

Mr. C. JONES remarked he had seen symptoms of "dropped elbow" in the case of a plough horse, resulting from fracture of the olecranon without displacement. The animal recovered in nine months.

Mr. ALLEN said that his experience of those cases termed "dropped elbow" was that when you had a horse meet with a serious accident such as fracture of the pedal bone, fracture of the navicular bone, etc., and when there was complete inability to bear weight, the animal would always put the leg in the same position. He had the case of a mare lately which hopped into his yard on three legs, elbow down, on point of toe, knuckling over ; thought the muscles and everything else was gone. On making an examination he took off the shoe and pinched all round ; no sign of pain on pressure ; tapped the centre of the foot with a hammer, and the whole leg quivered with pain ; the part was very bad and bloodstained. In a few days afterwards that mare broke out all round the coronet, and the hoof looked like sloughing off so he thought there was certainly fracture of the pedal bone ; but curious to relate the mare had recovered, was able to walk about, and had gone to grass. When he saw the animal at first, he thought the ribs were broken, but on examination found nothing wrong there.

Professor METTAM, in presenting a specimen, said in that particular case he made the post-mortem examination himself, and took particular pains with it. There was no attempt to repair at all ; they could see that in the cleaned specimen. The only tendency in the direction of repair noticed was a kind of pad of what looked like red marrow between the ends of the second rib.

He also presented what he considered a rather interesting specimen of an ordinary dissecting room subject. When before Christmas they were dissecting the anterior part of the thorax, a student who was engaged on the part said there was no left first rib : all they found in its place was the piece of tissue shown. He thought the Association would like to see the specimen. There was no first rib on the left side, save the two pieces of bone connected with a piece of ligamentous tissue. What was rather interesting was that Professor Bradley had described in one of the journals (*The Journal of Anatomy*) a similar case that occurred in the Dick College dissecting room ; the very next subject he saw on the table in the Royal Veterinary College of Ireland showed the identical condition that Professor Bradley had described. It had shown no depression of the shoulder ; nothing was noticed until they had removed the fore leg, and dissected the anterior part of the thorax.

Professor Mettam also presented two further specimens. The uterus of a pig, sent him by Mr. J. D. Maguire, M.R.C.V.S., of Lisnaskea, Co. Fermanagh, and he considered it unique in its way. He had shown it to

Professor Cunningham and Professor Bermingham, and they told him it was quite unique in their experience. The uterus is well developed, the uterine horns long and convoluted in the usual way. Looking for the ovaries he came to the two organs shown, and he found they were testes. There was a well-marked gland, and a well-developed epididymis. The glands were well-developed and typical. There was a small organ which was probably an unusually well-developed clitoris—which might give the appearance of being the free end of the penis. The case was particularly interesting (as mentioned by Mr. Maguire in his letter) inasmuch as the animal—he would not pretend to give its sex—had come four times into season, and had been sent four times to the boar. The pig was fattened and killed as it had failed as a brood sow.

(2) The fore limb of a cat. The cat in question was brought to the College, and he was asked if anything could be done for it. The only thing possible was amputation. The owners allowed him to give a dose of poison, and he managed to get the fore limb and examined it. There was a large tumour causing a large ulceration. One rather marvelled why the animal was allowed to live so long. The case was specially interesting as there was metastasis, and tumours in the lungs. The cat was in good condition, and she had had kittens about three months before. There were at least a dozen small tumours in the lungs, varying from the size of a pin's head to that of a pea.

Mr. HEDLEY contributed some observations with reference more particularly to Professor Mettam's specimen of the uterus of a pig. He said that he did not know of any animal which presented a larger number of anatomical irregularities, or monstrosities, than the pig—such as enlarged heads, extra legs, double heads, etc. It seemed peculiarly subject to freaks. It would probably be remembered that at one of their meetings Mr. Kerr introduced to their notice a specimen of a bonham with two snouts, four eyes, one throat, one stomach and body. They had several times had similar cases brought under their notice wherein this animal showed anatomical irregularities. There was a book published on the subject of "Atavism" (he forgot the author's name for a moment), but in it the author mentioned that he collected statistics with reference to the question of freaks, and he found that the cat offered a very large number of such examples. He (Mr. Hedley) had made observations with reference to many of our animal species which included both cats and swine, and he thought that the latter animal showed a greater proportion of freakish conditions than even the cat.

Professor METTAM agreed that, of the domesticated animals, the pig was one that showed, in his experience, the greatest number of anomalies; he thought the calf was second. During the last ten or twelve years he had dissected a large number of calves, and his experience was that he found nearly every abnormality that was presented by the human subject. He had also seen a great many monstrosities in lambs.

Mr. HEDLEY suggested that freaks were much more common in the case of animals having several young at one parturition than in those bearing only one or two.

Mr. R. B. FREEMAN brought under the notice of the meeting the desirability of having action taken to secure that members of their profession should be exempted from serving on juries. He mentioned that personally he had escaped for about three years, but quite recently was served with a notice to serve on a Grand Jury. He pointed out the hardship it was to have their time taken up in this way—more particularly in the case of a special jury—and mentioned other learned professions which had immunity from the service in question.

Mr. ALLEN promised to bring the matter under the notice of the Council.

Professor METTAM explained that on questioning some of the members of Council in London, he discovered that it would require an Act of Parliament to bring about the reform desired; or at all events that the existing Act should be amended so as to include a clause exempting members of their profession.

JAS. MCKENNY, *Hon. Sec.*

EXTRACTS AND NOTES

EXPERIMENTS ON DISINFECTION FOR THE LONDON COUNTY COUNCIL.

Report by Drs. KLEIN, HOUSTON, and GORDON.

In the following pages we beg to report on the experiments which we have carried out, in conformity with the arranged plan, in order to test various disinfectants, commonly used, on a variety of microbes, such as would be occuring in practice, and under conditions as nearly as possible similar to those generally met with.

The disinfectants tested were—(1) carbolic acid, (2) permanganate of soda, (3) bleaching powder, and (4) corrosive sublimate; these were used in the fluid state as appropriate solutions to be fully described later In addition to these, two substances were used in the gaseous state, viz, (5) formaldehyde, or formalin, and (6) sulphurous acid gas. For the opportunity and facility of using these two substances we are indebted to Dr. Newman, medical officer of health of Finsbury, who has been most willing throughout to help us, and who on several occasions himself superintended the process of disinfection. Dr. Newman has kindly furnished us with all the details, to be presently mentioned, concerning the amount of the gases used, cubic space of room, etc. For his help and great interest in the experiments we beg to tender him our very best thanks.

The microbes that we experimented with were—

(*a*) Spores of bacillus anthracis, representing one of the most resistant forms of pathogenic microbes.
(*b*) The staphylococcus pyogenes aureus, representing one of the most resistant forms of non sporing pathogenic microbes.
(*c*) The bacillus of typhoid fever. Non-sporing forms of pathogenic bacilli.
(*d*) The bacillus of diphtheria. Non-sporing forms of pathogenic bacilli.
(*e*) The bacillus pyocyaneus. Non-sporing forms of pathogenic bacilli.
(*f*) The vibrio of cholera: and
(*g*) The bacillus of human tuberculosis.

From this list it will be seen that most of the microbes chosen, in the first place include such as would in common practice be required to be disinfected, and in the second place are readily identified in the course of the experiment by their colour (staphylococcus aureus, bacillus pyocyaneus) or by their cultural characters (vibrio choleræ, bacillus typhosus, bacillus anthracis) or by their specific action on the animal (bacillus anthracis, bacillus diphtheriæ, bacillus tuberculosis). These are advantages which are not to be under-rated, considering that the materials subjected to disinfection are not themselves sterile, and are for hours exposed to mixture with saprophytic bacteria, conditions which naturally increase the difficulties of subsequent identification of the particular microbes subjected to disinfection.

The microbes enumerated above were in all instances (except the spores of bacillus anthracis and the bacillu tuberculosis) taken from a recent actively-growing culture (agar culture grown for 24 to 48 hours at 37 C.) so as to ensure the active and vigorous state of the microbe

to be disinfected. This is a point to be borne in mind, being of importance in all disinfection experiments. It must be obvious that in all cultures of non-sporing microbes, many of the individual microbes become less vigorous, and others even die off with the age of the culture; thus, for example, in the case of bacillus diphtheriæ, the virulence of the microbe becomes, in agar culture grown at 37 C., rapidly attenuated after the first two or three days; bacillus typhosus taken from a 24 to 48 hours' culture shows all bacilli actively motile; later, the number of such acting motile forms rapidly diminishes, indicating that the bacilli with age of the culture undergo distinct changes, whereby some of their important characters are for the time lost. As regards the spores of anthrax, these, as is known, are formed in the course of several days to a few weeks on the surface of the agar growth. The spores used in our experiments were ascertained to be fully virulent on the animal. The bacillus tuberculosis was used as it occurs in human pulmonary sputum, this being not only the form in which this microbe would be dealt with in actual practice, but also the form known to be virulent, and therefore suitable to be subjected to disinfection.

The experiments having been undertaken to ascertain which of the substances commonly in use are best for the object of disinfection under conditions such as exist in actual practice, it was of course necessary so to arrange our experiments that they would, as far as possible, imitate the conditions commonly obtaining. For this purpose we distributed the microbes on various materials, such as wall-paper, linen, cloth and wood, these being the chief materials which in ordinary practice are subjected to the process of disinfection in rooms, tenements and inhabited spaces.

The *modus procedendi* was this—

(*a*) Virulent spores of anthrax taken from the surface of agar cultures were distributed in separated milk, or in melted gelatine, so as to form a turbid emulsion. This emulsion was applied liberally on the above materials and allowed to dry in the air of the laboratory.

(*b*) From a recent culture of agar of the bacillus typhosus, bacillus pyocyaneus, bacillus diphtheriæ, staphylococcus aureus and vibrio choleræ respectively a turbid emulsion was made in broth or in separated milk; this was then applied liberally to the above materials and allowed to dry in the air of the laboratory. In the later experiments we made our cultures, not on agar, but direct on gelatine, and incubated the culture tubes for 24 hours at 37 C., whereby the gelatine became, of course, melted, and turbid from the growth. For the object of carrying out the experiment we applied the turbid (melted) gelatine culture liberally on the above materials. On cooling, the gelatine set.

In all these proceedings, therefore, the microbes used were emulsified, not in water, but in menstrua somewhat thicker, *e.g.* milk and melted gelatine. In choosing these menstrua we were guided by the fact that under the conditions obtaining in practice the virus to be disinfected is not suspended in water, but in thicker menstrua, *e.g.*, fluid typhoid stool, pus, blood, fluid cholera stool, diphtheritic throat secretions, and the same applies to the tubercle bacillus, for this as a rule is voided by the infected persons in the expectoration, which is mucopurulent. As was mentioned above, in all our experiments with tubercle we used pulmonary sputum, containing the tubercle bacillus; this was liberally applied on the materials and allowed to dry in the air of the laboratory.

The materials, paper, linen, cloth, wood, charged with the above microbes, were then exposed to the various disinfectants in the following manner—

(A.) In the case of the gaseous disinfectants, *i.e.*, formalin, or sulphurous acid gas, the materials charged with the microbes were carried in large glass cylinders (plugged) from the laboratory to the room where the disinfection was to be carried out, and here, having been taken out, were placed and fixed on a table. Next day they were replaced again in the glass cylinders and carried to the laboratory. Here the materials separately were placed in a tube of sterile broth—except the cholera-charged materials, which were placed in peptone salt solution—in this they were slightly washed, and then transferred to a fresh tube of broth (or peptone salt solution respectively) and both tubes incubated 37 C. The first washing was made for the sake of removing any excess of the disinfectant left in the materials.

The resulting growth was examined microscopically, culturally, and by animal experiment, in order to identify the microbe with which the material had been charged. It must be obvious that the materials, not having been sterile, and moreover, having been exposed after the disinfection, for some hours at least, to the air, would harbour a variety of microbes deposited on them from the air, and therefore the above broth tube, by incubation, would, and as a matter of fact did, in some instances, produce growths additional to, or other than, the microbes with which the materials had been intentionally charged. It was, therefore, a matter of no small importance to diminish the difficulties of identification by plate cultures or otherwise, of the original microbe, and this was done by our choosing the more easily identifiable microbes. In the case of the spores of bacillus anthracis, of staphylococcus aureus, of vibrio of cholera and of bacillus pyocyaneus the identification by one or another method (microscopically, culturally, animal experiment) is comparatively simple on account of the marked characteristics of the microbe. But in the case of the typhoid bacillus and the bacillus diphtheriæ the identification was considerably more difficult; the difficulties, as will be stated further below, were in great part due to a possible confusion with similar microbes (bacillus coli or bacillus xerosis, respectively), widely diffused in Nature and particularly in town air and dust.

In the case of tubercular sputum, the material charged with it were, after the gaseous disinfection, treated in a different way, viz., the surface layers (dried sputum) were scraped off and distributed in salt solution, and this was injected in considerable amounts subcutaneously into the groin of a guinea pig and the result watched. Cultural experiments, owing to the well-known enormous difficulties connected with the culture of the tubercle bacilli from sputum were not attempted, injection into the guinea pig being far the easiest and most reliable method of discovering whether or not the injected materials contained the tubercle bacillus in a living state. If the injection into the subcutaneous tissue of the guinea pig is, after several weeks (6—8), not associated with and not followed by tubercular enlargement of the inguinal lymph glands of the injected side, and if on a post-mortem examination no tubercles or tubercular changes are found in the viscera (liver, spleen, lung), then we may take it for certain that the injected matter did not contain living tubercle bacilli, and therefore the disinfection was successful and positive. But if in these and other experiments (carbolic acid, Condy's fluid, etc.) the inguinal glands and viscera did show the tubercular changes (anatomically, and after staining for tubercle bacilli), typical of inoculation tuberculosis, then the conclusion was drawn that the matter injected did contain tubercle bacilli in a living state, and therefore that the disinfection was unsuccessful and negative.

(B.) Disinfection with the fluid substances: carbolic acid, perchloride of mercury, Condy's fluid, bleaching powder, was carried out as follows:—The different materials, wood, cloth, linen and paper having been charged with the recent and active culture (melted gela-

tine) of the microbes (bacillus typhosus, bacillus, pyocyaneus, bacillus diphtheriæ, vibrio choleræ, spores of bacillus anthracis, staphylococcus aureus) were, after setting of the gelatine in the air of the laboratory, exposed for the required time in a large test tube to the disinfectant solution; after that the materials were taken out from these solutions and placed in a tube of broth (or peptone salt in the case of vibrio choleræ), and from here transferred to a new tube of the same culture medium and then incubated at 37 C., and treated in the same way as was mentioned in the case of testing gaseous disinfectants.

The same plan that was described above in the case of gaseous disinfectants with regard to the tubercular sputum, was also followed in the case of the fluid disinfectants, viz., the materials, wood, linen, paper, cloth, were charged with the sputum, and when dry, exposed to the disinfectant solution. After the exposure they were well washed in sterile water to remove the disinfectant, and then the scrapings from the surface of the materials (the dried sputum) were injected into the subcutaneous tissue of the groin of guinea pigs and the result watched.

The result of the experiments is thus summarised by the Medical Officer of Health:—

"Among fluid disinfectants carbolic acid, permanganate of soda bleaching powder, and corrosive sublimate have been tested. Among gaseous disinfectants formalin and sulphurous acid gas have been made the subject of experiment, the disinfection in this branch of the inquiry being supervised by Dr. Newman, medical officer of health of Finsbury, who has kindly facilitated the carrying out of the work.

Seven microbes have been experimented with, organisms representative of highly resistant and less resistant pathogenic forms being chosen. Consideration was necessarily given, in making the selection, to the question of the ease with which the particular microbes employed could be subsequently identified, but the list includes, it may be noted, the organisms of enteric fever, diphtheria, cholera, and tuberculosis.

Four different sorts of material, in ordinary practice requiring to be disinfected, namely, cloth, unvarnished or unpainted wood, linen, and wall paper were chosen. To them, microbes distributed in broth, in milk, or in melted gelatine, were liberally applied, and the charged materials were then exposed to the various disinfectants.

As regards *gaseous disinfectants* it was found that both formalin and sulphurous acid failed in the case of wood and cloth charged with spores. The contrast observed between wood and thick cloth on the one hand, and linen and paper on the other, may probably be explained by the fact that the microbe-containing mixtures soaked into the materials first named; the micro-organisms were thus not limited to the surface, whereas, in the case of linen and paper, the organisms were so limited, and therefore were more exposed. In one experiment even the little-resistant bacillus typhosus, exposed on wood or cloth, was not destroyed by formalin, but the reporters raise question as to whether the result was due to some fault in the experiment. This organism was, however, destroyed under like circumstances by sulphurous acid. Formalin vapour, on the other hand, showed to greater advantage than sulphurous acid in the case of tubercular sputum dried on linen and paper.

As regards *fluid disinfectants*, corrosive sublimate, 1 in 1000, with 24 hours' exposure, destroyed all microbes, including the spores of anthrax and the tubercle bacilli; carbolic acid in 5 per cent. solution, with 24 hours' exposure, failed to destroy anthrax spores, but was efficacious for all others. In the case of Condy's fluid, one teaspoonful to a pint with 24 hours' exposure gave a negative result; when used in five times that strength it was still practically of negative value; bleaching powder, generally speaking, only destroyed the less resistant forms of microbes, though in the case of anthrax spores on paper and on linen, this material proved more effective than carbolic acid.

In summary it may be stated that the typhoid bacillus was killed by all the disinfectants except Condy's fluid and bleaching powder. Condy's fluid gave a negative result in each experiment and bleaching powder for the disinfection of wood and cloth infected with this organism failed with one hour's exposure but was efficacious on 24 hours' exposure. The bacillus diphtheriæ was killed by formalin and sulphur dioxide. The vibrio of cholera was in each experiment destroyed by all the disinfectants except Condy's fluid and bleaching powder. Condy's fluid was practically of negative value, and bleaching powder was not always efficacious on one hour's exposure, but was successful with 24 hours. Bacillus pyocyaneus was acted upon in much the same way. It was killed in each experiment by all except Condy's fluid and bleaching powder. Staphylococcus aureus was also killed in each experiment by all except Condy's fluid and bleaching powder. Anthrax spores were only destroyed with certainty by perchloride of mercury, the other disinfectants either failing on each occasion or being uncertain, and almost invariably failing when wood and cloth were the materials to be disinfected. For tubercle bacilli, carbolic acid, and perchloride of mercury were the only disinfectants efficacious on each occasion. Condy's fluid and sulphur dioxide were of negative value and the other disinfectants unreliable. It is deserving of notice that neither formalin nor sulphur dioxide were efficacious for the wood or cloth infected with this bacillus.

SHIRLEY F. MURPHY,
Medical Officer of Health.

ARMY VETERINARY DEPARTMENT.

Extract from *London Gazette*:

WAR OFFICE, PALL MALL, June 13.

Vet.-Major H. T. W. Mann retires on retired pay.

June 17.

A despatch from Lord Kitchener includes the following in a list of officers "mentioned"—

Vet.-Lieut.-Col. T. Flintoff, A.V.D.
Vet.-Capt. F. Eassie, A.V.D.

A "Printer's Error."

The wicked P.D. is credited with many a stupid and ludicrous typographical error, but he has fairly excelled himself in the case in point recorded in last week's *Truth* as follows:—A farmer advertised—or, rather, meant to advertise—for an "experienced person, to milk a cow, and able to nurse." In what met the eye of the proof-reader, the "cow" was converted into "sow." The reader struck out the erring letter, and wrote the "c" in the margin in the orthodox way. Unfortunately, the compositor in correcting his work dealt with the wrong word, and as it went to press the advertisement appealed for an "experienced person to milk a sow, and able to curse."

We hail this man as a brother of the craft. This *is* a "printer's error"; but some of our correspondents call it a printer's error if they write "fore" when they mean "hind," or "Jones" when it should be "Buggins"—to say nothing of some who write what we can't read at all. —H. & W. B.]

Horses' Bread in Switzerland

This bread is made of third quality rye flour. and is easily digested and enjoyed; a feed is about 500 grms. for a farm horse. Its advantages are complete digestibility and the prevention of waste which occurrs in oat feeding. Rye bread is more appetising and nutritive than oats, not so much on account of its analysis but on account of its easier digestibility. It is also cheaper than oats.—*Rec. de Méd. Vét.*

CORRESPONDENCE.

COMPARATIVE DENTAL PATHOLOGY.

Sir,

I am anxious to obtain for the Museum of the Odontological Society of Great Britain a good collection of specimens illustrating diseases of the teeth and jaws in animals. Such a collection if at all complete would throw considerable light upon the pathology of the human teeth. I thought perhaps some of your readers would be able and willing to assist me by sending specimens of dental diseases and irregularities.

All specimens directed to me at 20, Hanover Square, W., would be most acceptable.—Yours faithfully,

J. F. COLYER.
(Hon. Curator of the Museum.)

20 Hanover Square, W.,
June 18th, 1902.

[We are asked to mention that the specimens should be saturated with a 2 per cent. solution of formalin, and that carriage will be paid on delivery].

SECRET REMEDIES.

Sir,

I notice that Messrs. Nell, of Louth, are taking advantage of your pages for advertising purposes To that I raise no objection. But should we as a profession encourage the sale of secret preparations? I say emphatically that we should not. Country practitioners especially have already enough "quack" nostrums to contend against. In many districts there is scarcely a case that comes under notice where some advertised remedy has not been used, such as Night, Sun, and Humbugs chocolate coloured "cure all," or some of Moon, Star, and Chaos "never fail" drink.

I have Messrs. Nells' price list by me, and find printed on front page, "issued to the veterinary profession only," and on turning to page 32, under "Apoplectine, or Milk Fever Cure" four testimonials which to me look as if they had come direct from stock owners. Can Messrs. Nell explain?

COUNTRY VET.

UTERINE DISEASE.

Sir,

In your valuable journal of last Saturday, May 31st, I read with great interest an essay by Mr. A. M. Crighton, M.R.C.V.S., on "Some diseases incidental to Pregnancy and Parturition in the Cow," read before the members of the Irish Central Veterinary Association. On page 744, second column, on the ninth line, he goes on to say, "Within the last couple of months he had a very singular case of inversion of the uterus, it occurred to a yearling filly that never had a foal. He was asked to go and examine the animal, when he saw a large mass behind it, which proved to be the uterus. There was an extraordinary gelatinous mass of the cotyledons of the uterus, which he removed."

May I venture to ask what was removed? Surely not the cotyledons from the uterus of a filly, for I was always given to understand the mucous coat of the mare was thin, smooth, and closely adherent to the muscular coat, clothed with ciliated epithelium, and furnished with numerous mucous follicles and glands peculiar to the organ—the utricular glands, but I think an absence of cotyledons. In the mare the chorion is attached all over the inner surface of the uterus, excepting at the os. In ruminants the chorion is attached to the uterus by cotyledons—dotted here and there over the surface numbering from 60 to 120 or more. While in the pig and carnivora the placenta is like that of the mare.

Perhaps Mr. Crighton will pardon my criticism as it is done in a friendly spirit and with the hope of correcting what I cannot help but think is a printer's error. In haste.—Yours faithfully,

JOSEPH H. CARTER.

Burnley, June 4.

CHEAP ADVERTISEMENT OR WHAT?

Sir,

In reference to the paragraph under the above heading, I beg to say that it was written by the local correspondent of *The Denbighshire Free Press* entirely on his own responsibility, and from information which he gathered from those assisting in the casting of the mare. I was not aware of its appearance (never taking any local papers) until my attention was called to it three weeks after its publication. In consequence I had an interview with the writer, and expressed my regret at his having written the article, as I hold fairly high views with regard to advertisements of this nature. Besides, I did not wish to give my professional brethren occasion to vent their *jealousies*. It is *very probable* that the area over which I practice *beyond this village* is a source of annoyance to V.S., for it is very evident that this criticism emanated from the brain of a jealous opponent who prefers to attack under a *nom de plume* rather than under his proper name.

Having deliberated over this effusion, I am not surprised at it, but fail to understand why V.S. has been so long concocting it, and why not have taken the proper course of sending it to the Registration Committee in order that I might be called into account for it.

Regarding operations, I always perform them in private admitting the presence only of those who actually assist. In this case I had valuable assistance rendered by Mr. Douglas R. Davis, a final year's student from the London College. For V.S.'s edification the mare in question was under chloroform and remained so during the whole operation, so he can judge the extent of the *animal's suffering* and of the *surgical shock it experienced*.

With regard to previous reports from this *village* I can positively aver that if any appeared it never came under my notice for I am not over anxious, nor do I consider it necessary, that any operation of mine should be thus advertised. Should V.S. wish to enlarge on his ebullition or declare war against one whom he seems to be so antagonistic to, let him take the field like an *honourable gentleman* and do battle in an upright and straightforward manner and subscribe his own name. It is probable that I *may* have something to say to him *if* he does.

Apologising, Mr. Editor, for trespassing so much of your valuable space.—Yours faithfully,

W. HUGHES.

Caerwys, June 16.

COMMUNICATIONS, BOOKS, AND PAPERS RECEIVED.—Messrs. R. Stewart, W. Hughes, H. Horace Hoskins. "Country Vet."

American Veterinary Review, The Macclesfield Times, The Louth Advertiser.